

REMARKS

Applicant has reviewed the Office Action mailed on June 23, 2005 as well as the art cited. Claims 33-37 have been cancelled without prejudice or disclaimer and Applicant reserves the right to reintroduce them in a continuation application at a later date. Claims 4, 17, 18 and 38 have been amended, claims 7, 9, 19-32 and 42-43 have been withdrawn from consideration and claims 44-48 have been added. No new matter has been added. As a result, claims 1-6, 8, 10-18, 38 and 44-48 are currently pending in this application.

Claim Objections

Claim 4 was objected to because of a typographical error. At line 4, claim 4 has been amended to correct "provide" to "provided." Therefore, withdrawal of this objection is respectfully requested.

Further, claim 4 has been amended to correct an identified antecedent basis issue. Line 3 has been amended to remove "printed circuit board" and replace with "planar substrate" as there was no antecedent basis for the term "printed circuit board." As a result, claim 4 is now in condition for allowance.

Rejections Under 35 U.S.C. § 112

Claim 17 was rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. In particular, the Examiner indicated that in claim 17, line 5, there is no antecedent basis for "the first axis" or "the first sine coil." Claim 17 has been amended to depend from claim 15, thereby introducing antecedent basis for the "first axis" and the term "first sine coil" has been corrected to "first coil". As a result, Applicant requests withdrawal of this rejection.

Furthermore, claim 18 has been amended to depend from claim 15 and claim 40 has been amended to correct "first sine coil" to "first coil". Claim 38 has been amended to incorporate features of claims 33 and 37 and to correct a typographical error. No new matter has been added.

Rejections Under 35 U.S.C. § 103

Claims 1-6, 8 and 33-36 were rejected under 35 USC § 103(a) as being unpatentable over Brosh (U.S. Patent No. 4,253,079) in view of Hasegawa et al. (U.S. Patent No. 4,959,631). This rejection is traversed.

Claim 1 is directed to a man-machine interface including at least one planar substrate having formed thereon a magnetic field generator, the magnetic field generator comprising conductive tracks formed on at least two planes defined by the at least one planar substrate, a mounting carrying an intermediate coupling element, the mounting allowing movement of the intermediate coupling element along a measurement direction transverse to the planar substrate in response to a force applied by a user, and a detector operable to detect the position of the intermediate coupling element in a magnetic field generated by the magnetic field generator.

Claims 1-6 and 8 are directed to a man-machine interface. Neither Brosh nor Hasegawa et al relates to a man-machine interface. Accordingly, it is submitted that claims 1-6 and 8 are not made obvious by the combination of Brosh and Hasegawa et al.

Furthermore, Applicant asserts that it is not feasible to combine the disclosures of Brosh and Hasegawa et al. Brosh relates to a linear variable differential transformer (LVDT) in which the electromagnetic coupling between a primary winding and a sequence of secondary windings varies in dependence upon the position of a magnetic core. For such an arrangement, the electromagnetic field distributions around the primary winding and the secondary windings is crucial. On the contrary, Hasegawa et al simply relates to a planar inductor which has spiral conductor coils sandwiched between ferromagnetic layers with insulating layers interposed therebetween. The presence of such ferromagnetic layers will disrupt the electromagnetic fields caused by current flowing through the planar inductor, and accordingly a skilled person designing an LVDT would dismiss the coil arrangement of Hasegawa et al as being inappropriate.

As a result, neither Brosh nor Hasegawa et al. alone or in combination teach or suggest the man-machine interface found in claim 1 and claim 1 should be allowed.

Claims 2-6, 8, and 10 depend either directly from allowable claim 1 and should also be allowed.

Claims 33 to 36 have been cancelled.

Claims 10-11, 12-13, 14-15, 16-18 and 37-41 were rejected under 35 USC § 103(a) as being unpatentable over Brosh, as modified, as applied to claims 1-6 above, and further in view of Ely et al. (U.S. Patent No. 6,489,899).

With regard to claims 10-18, it is submitted that these claims are allowable at least because they are dependent, either directly or indirectly, on allowable claim 1.

Claim 37 has been cancelled.

Claim 38 is directed to a position sensor and includes the features that:

a first excitation winding comprises at least one coil which is arranged about a first axis which is in the plane of the planar substrate; and

a second excitation winding comprises at least one coils which is arranged about a second axis which is perpendicular to the plane of the planar substrate.

Such an arrangement allows suitable magnetic fields to be generated which allow the position of a coupling element along a measurement direction transverse to the planar substrate to be measured using conductive tracks formed on only two surfaces of the planar substrate and via holes therethrough. None of the art citations discuss or suggest such an arrangement. Accordingly it is submitted that claim 38 is not obvious over Broash in view of Ely et al. As a result, claim 38 should be allowed. The above features are also present in claim 15 and claim 15 is also allowable.

It is submitted that claims 39-41 are allowable at least because they are dependent on claim 38.

New claims 44-48 include new independent claim 44 which includes the features that:

a planar substrate has conductive windings formed thereon by conductive tracks on a first planar surface and a second planar surface interconnected by through-plated via-holes through the single planar substrate; and

the conductive windings include at least one coil which is arranged about a first axis which is in the plane of the planar substrate and at least one coil which is perpendicular to the plane of the planar substrate.

Such an arrangement is not discussed in, or suggested by, any of the citations and claim 44 is in allowable form.

Claims 45-48 are dependent on claim 44 and are also allowable.

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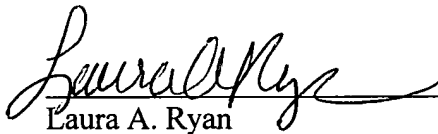
Title: SENSING APPARATUS AND METHOD

CONCLUSION

Applicant respectfully submits that claims 1-6, 8, 10-18, 38 and 44-48 are in condition for allowance and notification to that effect is earnestly requested. If necessary, please charge any additional fees or credit overpayments to Deposit Account No. 502432.

If the Examiner has any questions or concerns regarding this application, please contact the undersigned at 612-455-1685.

Respectfully submitted,

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Laura A. Ryan
Reg. No. 49,055

Attorneys for Applicant
Fogg and Associates, LLC
P.O. Box 581339
Minneapolis, MN 55458-1339
T – (612) 332-4720
F – (612) 332-4731

Attachments (Appendix)

Amendment to the Drawings

Red-lined Figures are included in attached sheets of Fig(s). 6 and 7. These sheets, which include Figs. 6 and 7, indicate the changes.

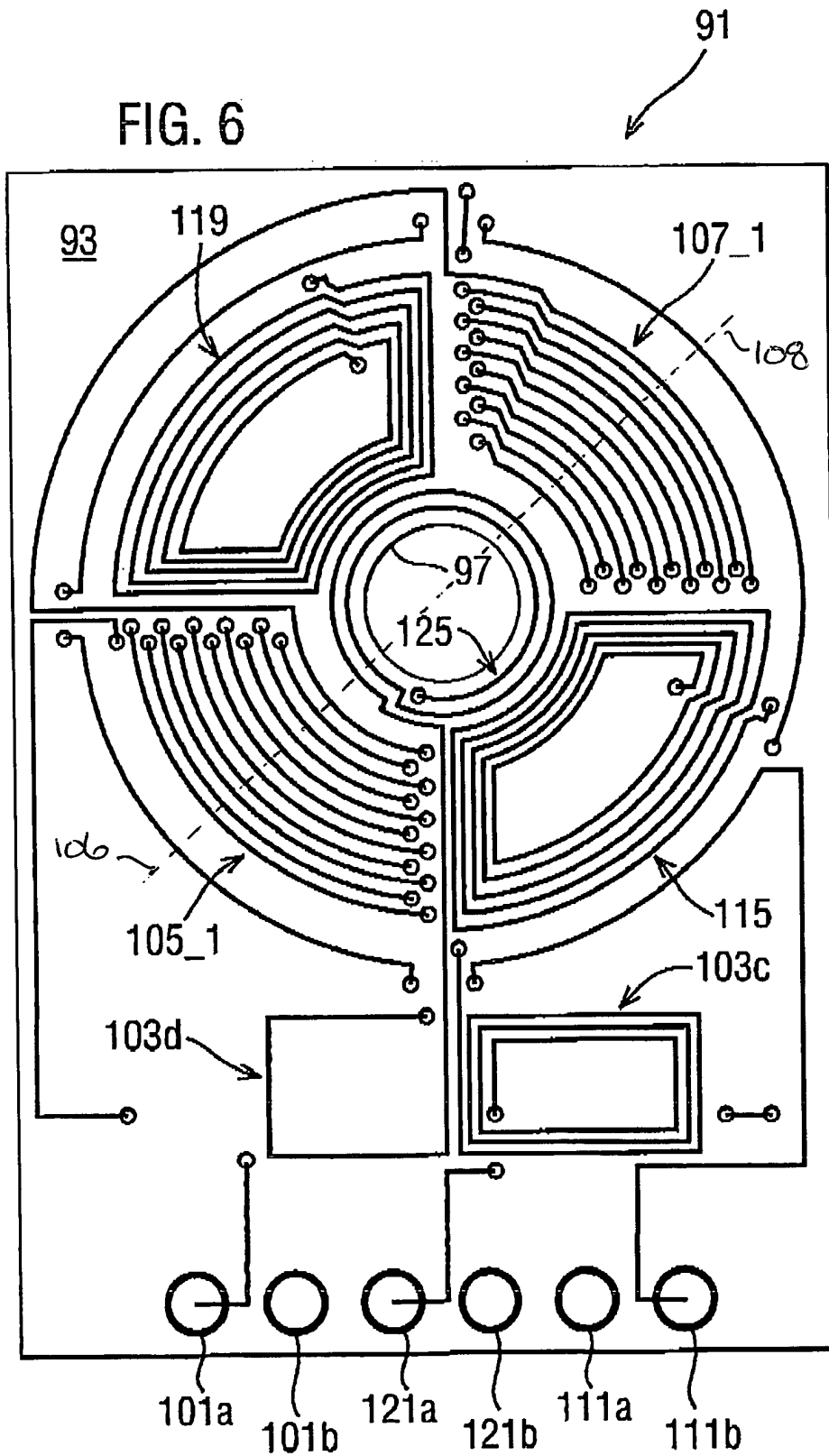
Specifically, in response to the objections set forth in the present Office Action, enclosed are Replacement Sheets 5/14 and 6/14 in which a first radial axis 106 and a second radial axis 108 within the plane of the PCB 91 and a first axial axis 114 and a second axial axis 118 perpendicular to the plane of the PCB 91 have been shown. Furthermore, the specification has been amended to conform with the amended drawings. No new matter has been added.

Attachments: Replacement sheet(s) for Figures 6 and 7 are also included and they replace the original sheets including Figures 6 and 7.

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FIG. 6



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FIG. 7

